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xx

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## GAZETTEER OF ETAH

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## PREFACE.

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THIS volume is a revision of the Gazetteer of the Etah district prepared by Mr. E. T. Atkinson, and published in 1876. In compiling it I have made use of the Settlement Report of the late Mr H. O. W. Roberts, I.C.S., and of material collected by several District Officers. I am particularly indebted to Mr. W. B. Cotton, I.C.S., for the assistance he has rendered me.

NAINI TAL :      }  
July 1909.      }

E. R. N.

## GAZETTEER OF ETAH.

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### ABBREVIATIONS.

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J. R. A. S.—Journal of the Royal Asiatic Society.

J. A. S. B.—Journal of the Bengal Asiatic Society.

E. H. I.—The History of India, as told by its own Historians; by Sir H. M. Elliot.

## CHAPTER I.

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### GENERAL FEATURES.

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The district of Etah lies in the central portion of the Ganges and Jamna duab, and is bounded on the north by the Ganges, which separates it from the Budaun district; on the west by the districts of Aligarh, Muttra and Agra; on the south by Agia and Mainpuri, and on the east by Farrukhabad. The district lies between the parallels of  $27^{\circ}18'$  and  $28^{\circ}2'$  north latitude, and  $78^{\circ}11'$  and  $79^{\circ}17'$  east longitude, and is of very irregular shape, the Jalesar tahsil running out in a long promontory between the adjoining districts of Aligarh, Muttra and Agra, and both Etah-Sakit and Aliganj thrusting out large wedges of their territory into the Mainpuri district. The total area, according to the recent survey, is 1,101,996 acres, or 1,722 square miles. The greatest length from south-west to north-east is 62 miles, and from north to south a line drawn through the town of Etah measures 43 miles.

The district is divided into two sections by the Kali Nadi, flowing from north-west to south-east, and this river, the Ganges and the Buriganga, an old bed of the latter, govern the physical characteristics of the country. Speaking generally it may be said that the area to the south-west of the Kali Nadi, consisting of the Jalesar and Etah tahsils and comprising rather less than half the total area, is a fertile tract of stable cultivation, while the northern portion, which includes the tahsils of Kasganj and Aliganj, is the very reverse, being subject to remarkable vicissitudes of fortune and sensitively responsive to any abnormal variations of season and rainfall. There is also a general tendency to deterioration from west to east throughout the district. Topographically there are four distinct tracts: first the lowlands between the river Ganges and its old high bank; second the upland between that bank and the crest of the Kali Nadi bank third the valley of the Kali Nadi and fourth the tract south of the river

The first or *tarai* tract, stretching from the present bed of the Ganges to its old high bank, which is usually at some distance—in places as much as ten miles—to the south of the Burhganga, is about 390 square miles in extent. This tract comprises the whole parganas of Puzpur-Badaria, Aulai and Nidhpur, more than half of pargana Soiron, about one-third of Patiala, and portions of Pachlana, Sahawar and Azamnagar. The soils throughout are of an alluvial character, differing from the soils of the upland in that they apparently contain a larger admixture of vegetable matter. Even where the proportion of the sand is high they are soft to the touch and resemble rather artificial soils, the composts of the gardener, than natural earth. It is probably this high proportion of vegetable matter that enables them to grow relatively richer crops than the corresponding soils of the upland. Wheat, for instance, is constantly grown in soils which in other parts of the district would be regarded as too sandy for it. The most valuable of the *tarai* soils is the rich soft loam found along the edge of the Ganges, of which the distinguishing feature is that it will grow sugar without irrigation. Similar but less valuable soil is met with along the edge of the Burhganga. Between the two the level lies higher and the quality of the soil deteriorates from north to south, being very sandy just above the Burhganga. South of that stream there is always a considerable stretch of very poor soil, either wind-blown sand or barren *urer*, but towards the high bank there is a great improvement and we come into rather lowlying but rich soil usually under sugar in the west of the district and wheat in the east.

The sub-soil throughout this tract is sand, the pure white sand of the Ganges bed and the fertility of a given tract depends more upon the depth than the quality of the alluvial deposit with which the sand is covered. The surface is everywhere uneven, following, though with less marked variations, the contours of the underlying sand; so that the hollows, which were the first to catch the alluvial deposit, are richer than the ridges.

It is convenient to use for the second tract the term central dual tho g' as alr alry explained it is not a solute y a erate th northern boundary b mg the old high ank f the Ganges

and not the Burhganga itself. This comprises the major portion of parganas Pachlana, Bilram, Soron, Sahawar, Sirhpura, Patiali Barna and Azamnager, with an area of about 428 square miles. The character of the soils in this tract depends largely upon the distance between the Kali Nadi and the old high bank of the Ganges. At the western boundary of the district the distance is about 13 miles. The Kali Nadi is then running east, while the trend of the high bank is to the south-east with the result that when pargana Sahawar is reached the distance has shrunk to about eight miles. From that point to the commencement of pargana Barna it varies from 8 to 10 miles. At the junction of parganas Sirhpura and Barna the Kali Nadi takes a sweep to the south, and the distance rapidly extends to 16 miles. A reversion to its original course again lessens the distance; but about level with the town of Aliganj the Kali Nadi turns to the south and the high bank northwards, and from thence to the boundary of the district there is a continually increasing divergence. The crest of each river is marked by a belt of sand, and it is a well marked characteristic of this tract that wherever they approach one another these ridges stretch out as though to join hands, forming an almost continuous sea of sand from one river to the other. Where, on the contrary, they diverge, the sand seems to shrink in, and the centre of the tract is occupied by a level plain of loam and *usar*. Elsewhere the surface is uneven, the sand being pitted with hollows and depressions in which water collects and which contain a little firmer soil.

The subsoil in this tract is nearly everywhere sandy, and as a consequence the natural irrigation is deficient. In places, as in the east of Aliganj and near Sahawar, we come upon a firm subsoil, but such tracts stand out as entirely distinct from the rest of the Duab, resembling in stability and fertility the country south of the Kali Nadi, and they are unfortunately few and far between.

The width of the valley of the Kali Nadi varies according as the descent to the lowland is gradual or abrupt. On the southern bank and the eastern half of the northern bank this descent is almost everywhere gradual. But in the western half

of the northern bank the descent is in many places fairly sudden, often with a kind of steppe between the crest and the valley bottom. The soil on these steppes though sandy is usually very fertile and capable of high cultivation, and chosen as the position for the village site.

The lowest portion of the valley is usually that at the foot of the high bank where the soil is always rich but liable to swamping. This is especially the case where the drainage channels from the upland make their way down. These, instead of running directly out to the river, generally turn and run more or less parallel to it for some little distance. Almost universally the soil on the immediate margin of the stream is a good loam, well raised and not too stiff, and this belt is commonly the best and least uncertain portion of the valley. Sometimes soil similar to that on the river bank extends nearly back to the rise to the upland. This is more often the case in the west of the district than in the east, deterioration from west to east being, as already stated, a marked feature of the district. More commonly however this central part is inferior to the rest of the valley, and if raised is sandy or if lowlying is infected with *reh*.

The stream of the Kali Nadi does not change its course and there is no diluvion. The whole valley is however liable to flooding when the river rises with heavy rain, and the autumn crops are rarely grown. As a rule, the valley dries in time to permit of sowings for the spring harvest, and the crops are luxuriant. But in seasons of heavy rain, especially if that rain comes late in the season, sowing may be impossible, or possible only after very inadequate preparation of the soil.

The tract south of the Kali Nadi comprises pargana Jalesar, practically the whole of pargana Marehra and Etah-Sakit, two-thirds of pargana Sonhar and a portion of pargana Biliara. Its area may be put at 675 square miles. This tract is distinguished by the absence of sandy soil, and is by far the richest portion of the district, as also the most stable. The prevailing soil is a good loam, and the barren area consists almost entirely of *usar*. As we proceed south towards the Isan, which runs through the southern portions of parganas Marehra and Etah-Sakit the soil becomes stiffer and clay is more frequent. On the opposite side

of the Isan the converse in the case. The stiffest soil is in the north, and this is followed by good loam and then by lighter loams. The Isan in fact marks the centre of the Kali Nadi-Jamna duab and the southern portions of pargana Jalesar are beginning to feel the influence of the latter river. And the soils, following what appears to be the universal rule of these provinces, become lighter as they approach it. The subsoil in most parts is firm so that irrigation is easy. In the extreme south-west however the spring level sinks to a marked degree, increasing materially the cost of raising water. Moreover with this fall in the level the water becomes brackish and cannot be used for irrigation in the earlier stages of growth. The weed *baisurai* also makes its appearance in the south-west, which is thus markedly poorer than the rest of the tract.

It will be seen from the foregoing description that the four chief rivers, the Ganges, the Burhganga, the Kali Nadi and the Isan, are, as it were, the skeleton on which are moulded the physical features of the district.

The Ganges practically forms for some 32 miles the northern boundary of the district, though a few villages have lands on either side, and now flows at a distance varying from three to ten miles from its old high bank. Tradition asserts the change in the river's course to have taken place some eight or nine hundred years ago, but there is good reason for referring it to some period subsequent to the reign of Akbar.\* The river is now tending to return towards its old bed, and there has been a good deal of diluvion recently, which is still continuing. The Ganges is crossed during the cold weather by bridges of boats at Kachhlaghat and Kadirganj, ferries being substituted during the rains. The Ganges is the only river in the district on which boats of any size can be navigated, but the use of the river as an artery of commerce has now almost entirely ceased. The merchants of Kasganj, who used to send down large quantities of cotton, indigo and oil-seeds to Kachla-ghat for transmission down the Ganges, now employ the railway, and the river boatman's occupation is gone. The castes, such as Mallahs, Kahars and Dhimars, who nominally live by industries connected with the rivers have for the most

part turned cultivators; eking out their resources by fishing when occasion serves.

The former bed of the Ganges is marked by the Bur'ganga. This stream flows as a rulo at a considerable distance from the old high bank, which is locally known as the *pukhar* and has a mean height of about 20 feet above the lower plain, rising at times to 30 or 40 feet and varying considerably in appearance at different places. Sometimes it descends with a gentle slope to the lowlands, into which it impereceptibly disappears, at others it rises abruptly like a wall, or juts out into the plain like the bastion of some huge fort. The current of the Burhganga is sluggish and its course tortuous, blocked in many places by sand-spills and weeds. It is thus unable to cope with a rainfall at all above the normal and floods are common and of long continuance, while the lands in its neighbourhood are liable to waterlogging. A great deal has however been done since 1891 by the irrigation department to improve the drainage of this stream. Its bed has been excavated and straightened and is annually inspected with a view to keeping it clear of weeds.

The Kali Nadi or Kalindi, as it is often called locally, flows to the south of the Burhganga at a distance of from seven to seventeen miles. Entering the Etah district from Aligarh in the north-west its general trend is to the south-east, and it finally becomes the southern boundary of the Aliganj tahsil. Its total length in the district is about sixty-five miles. The valley through which the river flows is deep and about three miles in width from crest to crest, and though the stream floods readily, its inundations, however long continued, never extend outside their valley. There are bridges over the Kali on the Hathras road at the 32nd and 33rd miles and at Nadrai. At this crossing a bridge was originally built about 130 years ago by a man of the Teli caste, but suffered from the fault common to most bridges of indigenous design of having the diameter of the piers much in excess of the waterway. In 1878, when the aqueduct conveying the Lower Ganges Canal across the river was built, it was found necessary to remove this bridge which was replaced by one of more modern construction. A railway bridge was built as well in 1884. On the 17th July in the

following year unusually heavy rain in the districts of Aligarh and Bulandshahr brought about the worst flood on record. The Kali came down in spate and swept away the aqueduct and both the new bridges, destroying at the same time hundreds of lives and wrecking the whole valley. In addition to the loss of crops, houses and cattle, some of the land of the riverside villages was carried bodily away and some injured by a deposit of sterile sand. A new and magnificent aqueduct designed by Lieutenant-Colonel Home, R.E., now carries the canal across the river. It took four years to build and cost Rs. 25,83,487. The two bridges were replaced in 1886 by an iron one of nine spans which serves the double purpose of the railway and the road. The ruins of the old Teli's bridge still form a picturesque feature of the scenery at Nadiai. At Dhumri, on the Etah-Aliganj road, there is a bridge of boats which is removed in the rains, and ferry boats ply across instead. Other ferries are at On to the north of Etah on the Etah-Patiali road, at Lalpur-Jahangirabad on the road from Aliganj to Kuraoli, at Partabpur-Katara, and on the road from Etah to Sahawar. These ferries are kept up during the whole year as in the rains the river is not fordable, and at other seasons owing to its use as a canal escape its depth varies considerably. The Kali was in former years extensively used for irrigation, but the irrigation department has now prohibited the construction of *bands* and little use is now made of its water.

The Isan is apparently the outcome of a wide shallow depression which is said to be traceable from Sardhana in Meerut down to the border of this district. On the west it is still an ill-defined depression rather than a waterway, but it develops a distinct bed about half way across the district. Its level however is never much below that of the surrounding country. It has no *tarai*, the approach to it being merely marked by extensive stretches of somewhat lowlying clay lands, and it thus, when in flood, readily spreads over considerable stretches of country. Another branch, which runs through Jalesar and is better defined, is more commonly known as the Sirsa or Dhumri. There are bridges across the Isan where it is crossed by the

roads from Etah to Tundla, Shikohabad and Nidhauri, and from the latter place to Nagaria.

Other streams are the Arind or Ratwa or Rind, which flows through a portion of the south of the district beyond the Isan; though a considerable river in the rains, is in the cold and hot seasons almost entirely dry; and the Bagaih, which rises in the north-east of Azamnagar, where it forms a series of shallow depressions, deepening occasionally into *jhils*, and ultimately becomes a stream which flows into the Varanukhabad district. As a rule it dries up soon after the rains and its bed affords some good *tarai* cultivation. There are also several small tributaries of the Kali Nadi, such as the Nim, which flows into it at Barswa near Bilram, the Karon nala, which joins it near Mandri and is bridged in two places where it is crossed by the roads from Etah to Kasganj and Marchua; the Karna nala which falls into it near Dhumri, and the Bhongaon nala, which after passing about five miles from Aliganj joins it near Sarai Aghat.

The uneven surface and imperfect drainage of a large part of the district have caused the formation of considerable sheets of water in the numerous depressions. Most of these diminish very much in area during the cold and hot seasons, and some exist for a short time at the end of the rains. There are however a number which are perennial, though liable to great shrinkage in a year of drought. Among these the Rustamgaih *jhil* in pargana Marehra, the Mahota and Thana Dariaoganj *jhils* in pargana Azamnagar, the Sikandaipur *jhil* in Nidhipur and the Patna *jhil* in Jalesar, deserve the name of lakes. Smaller sheets of water are to be met with near Etah, Aliganj, Sahawai, Sakit, Northa in pargana Bilram, Pahlajpur near Soron, Kasol and Awa. All are the haunt of thousands of water fowl during the cold weather, and, though they are not much used for irrigation, excellent crops are grown on the moist land left at their margins as the water dries up, while the shallower parts are planted with valuable crops of the *singhara* or water-nut. According to the figures of the recent survey, 26,516 acres in all, or 2·6 per cent. of the total area, are covered with water. But this includes the rivers and separate statistics for the *jhils* are not available.

The previous pages will have given some idea of the natural drainage of the district as represented by its rivers. Though the district lies on the Ganges watershed the area that drains directly into that river is small, consisting only of a strip not more than six miles in width. In this tract the drainage is excellent, the Ganges forming an efficient outlet for any quantity of rain water. The same cannot be said for the next section of country to the south. Here the watershed lies about two miles south of the old high bank of the Ganges and the only outlet on the north is the Burhganga which, as already stated, is unequal to the task of carrying off a heavy fall. The rest of the northern portion of the district drains into the Kali Nadi which is capable of dealing with considerable volumes of water, and would give little trouble were the drainage approaches to it better. But these approaches are very unsatisfactory, consisting of shallow, ill-marked depressions, tortuous and obstructed by numerous ridges of sand. The result is that in years of heavy rainfall water collects in the depressions, spills from one to the other, destroying in its course the crops in the intervening lands, and instead of passing away to the river is absorbed in the sandy sub-soil, where it accumulates, causing a serious rise in the spring level. The extreme variations to which the level of this subsoil water is liable may be illustrated by the example of pargana Sahawar, for which the figures are available for a considerable period. In 1840 Mr. Edmonstone, who was revising the settlement, gave the spring level as lying at from 10 to 12 feet below the surface. At the next settlement Mr. Ridsdale put it at 20 feet, while at the time of Mr. Feirard's revision in 1891-92 water was within 5 or 6 feet of the surface, and the lower parts of the pargana were flooded. Measurements taken by the canal department between 1884 and 1888 in 31 selected wells showed a mean rise of 7.2 feet in that period, while further measurements in 25 of those wells, continued up to 1899, showed a fall of 3.2 feet. These statistics point to the fact that while excessive rainfall acts very speedily in raising the level, the subsequent fall is a slow and gradual process, and account for the long duration of the depression caused by suppation. Much has been done of late years to improve the

drainage. On the extreme west a cut has been made from the Burhganga to the Ganges through Alipur, and an embankment thrown across the Burhganga at this point. That river is thus relieved of the Aligaih drainage, which passes off direct to the Ganges. A series of cuts has also been made connecting all the large depressions in the *torai* with the Burhganga, whose channel has been straightened by cutting across various bends while sand-spills and weeds have been cleared away.

In the upland several elaborate schemes of drainage have been carried out. The most westerly is the Jhabar system, which starts near the junction of pargana Pachlana with pargana Bilram, and serves both these parganas, discharging into the Kali Nadi at Barai Khera in pargana Sahawar. The large and important set of works known as the Sirhpura drainage serves the southern half of Sahawar and Subpura. The Mohanpur system deals with the west of Sahawar and the north and east of Sirhpura and with Patiali, discharging into the Kali Nadi near Dhamri. Another important drain, also part of the Mohanpur system, taps the numerous swampy depressions in the west and centre of pargana Azamnagar, discharging into the Kali Nadi near Pinjri. Finally the Baghar system carries off the very complicated drainage of the north and east of pargana Azamnagar.

South of the Kali Nadi the natural drainage is more efficient; but here also improvements have been effected. The most important works have been the digging out of the bed of the Isau and of the Karaon Nadi and the drainage operations in the neighbourhood of Etah itself. A proposal is also on foot to dig out the bed of the Kaknadi, an affluent of the Isau, and to divert it into the Kali Nadi. When this is done there should be very little trouble in the southern tract. In any case there is less danger here than in the central duab, for when water does collect it is in depressions filled with clay, by which it is kept on the surface and prevented to a great extent from soaking into the subsoil.

According to the recent survey the unculturable waste land of the district amounted to 110,594 acres, or 10 per cent of the whole. Of this 11,871 acres consist of village sites, 28,516 acres

are under water, and 72,207 acres are otherwise barren. While both the former heads show increases of area since the last settlement, which can be accounted for by the increased accuracy of a professional survey, the last named has decreased by more than five-eighths, the previous figure being 192,239 acres. This is only to be explained by a new principle of classification under which land capable of growing any form of vegetation whatever, though it were only a few blades of grass or a few stunted *dhak* trees, has been returned as culturable. Such land, however, as it would never repay the cost and labour of cultivation, and is never in the least likely to be brought under the plough, would seem more properly to come under the description of barren waste, and the figures of the previous settlement, according to which about one-fifth of the total area is shown as unculturable waste, may be taken as coming nearer the mark.

The greater part of this waste consists of stretches of treeless *bhur*, and of *usar*, wide plains of which form the most striking feature of the landscape in the north of the Jalesar tahsil. In the *usar* land the soil is impregnated with certain salts of sodium, principally the carbonate, whose efflorescence covers the surface with the white impalpable *reh* which gives these dreary plains their characteristic appearance. Various theories have been advanced to account for the excess of sodium in these tracts and numerous experiments have been and are still being made in the reclamation of the *usar* soil,\* but no rapid or inexpensive plan has yet been devised. It is stated that complete success has been obtained by the application of gypsum,† but this method is scarcely practicable on a large scale. A good deal has been done by the Raja of Awa on his estates. By watering the land with indigo water and manuring heavily with indigo refuse a few fields were reclaimed and the soil induced to bear flourishing crops. But the complete decay of the indigo industry has rendered this system impossible of continuance, while its cost would in any case have prevented its general adoption. He has also made *bubul* plantations in other *usar* lands, and the trees are doing well, but whether the land will be fit for cultivation after the removal of the trees remains to be seen. Another experiment

\*Agricultural Ledger 1897 | † loc. cit.

which has met with at least partial success is founded on the fact that the sodium salts are concentrated in the first few inches of surface soil. By enclosing land from grazing, and thus encouraging the grass to grow, the salts are caused, or allowed, to descend from the surface soil into the subsoil, where they diffuse themselves, leaving the surface sufficiently free to permit of the growth of crops. This however is a very slow process and the experiments have not yet been carried on sufficiently long for it to be known whether the practical results will bear out the theoretical conclusions. As far as our knowledge goes at present the plantation of trees, particularly the *babul*, would appear to be the only productive use to be made of this class of waste land. The efflorescence of *reh* is found in various parts of the district outside the regular *usur* plains, and in such areas the land is always poor, though not necessarily unculturable. The whole *tara*-tract in the neighbourhood of the Burhgauga is in places infected with *reh* and it is bad in several villages in the east of Nidhpur, where there is reason to believe that it is spreading. In pargana Marehra a considerable increase in the *reh*-infected area was at one time attributed to the influence of the canal, but the general consensus of expert opinion is now opposed to this theory, and the canal is acquitted of responsibility, though in the neighbouring district of Mainpuri it was with equal unanimity found guilty of causing a similar phenomenon.

There are no forests in the district and but little jungle, what there is consisting mainly of patches covered with *dhak* trees (*butea frondosa*). One of the largest stretches of jungle is that of Kachhyawara in pargana Azamnagar. Others are at Pinjri, Ahrai, Thana Daria-ganj and Rampur in the same pargana; at Utarna, Sikahra, and Arjunpur in pargana Sirhpura; at Mahadeo-ka-ban and Sonsa to the north of pargana Sonhar; Karhai in pargana Pachlava, and Sir-a Tibu on the Etah and Kasganj road in pargana Marehra. The *dhak* is largely used for fuel, and has diminished very considerably during the last fifty years, not much remaining of the belt, 10 *kms* in width, which used to continue into this district from Mainpuri, and afforded shelter to a good deal of game and also to numerous bands of dacoits. These jungles are now principally used for grazing.

cattle, the tribes engaged in this employment being Ahirs and Gadariyas, called professionally Charwayas, Chaupayas and Gwalas, who receive fees varying from one to four annas for each head of cattle under their charge. Besides the *dhak* jungles there are the *katri*s or reed-producing lands along the Ganges and Burhganga, which are a source of some profit to the villages to which they belong. The long coarse grass (*gandar*), which is found all over them, is carefully gathered every year, and the longer and stouter reeds (*senta*) used for making chicks and thatching, while the smaller serve to make screens, cart-tilts and so forth. The *khush khas* grass is also found in swampy ground, especially in the Aliganj tahsil. This is the material used for the manufacture of door-tattis, while a perfume (*itr*) is also extracted from it. The gathering of these grass products of the jungle is almost entirely in the hands of the Kanjar caste. The commonest trees found in the district are, besides the *dhak*, the *babul* or *kikar* (*acacia arabica*) the *nim* (*melia azadirachta*) the *jamun* (*eugenia jambolana*) and *shisham* (*dalbergia sissoo*), the last named producing by far the most valuable timber.

In addition to the trees which grow wild in the waste lands and the scattered trees planted here and there among the fields, some 14,270 acres, or 1·3 per cent. of the total area of the district, are planted with groves, consisting principally of the mango tree, though most of the other common varieties of fruit and timber trees are to be found among them.

The proportion of the area devoted to groves does not vary very much from pargana to paigana, the widest departures from the district average being in the alluvial parganas of Faizpur-Badaria and Aulai, where the percentage is only .6. Barna is the best furnished pargana in this respect, having 2 per cent. of its area covered with groves, while its immediate neighbours Azamnagar and Patiali are nearly as well off. Tree-planting would seem to be on the increase in the district, about one-eighth of the present area representing additions since the settlement of 1873. There is some reason to believe that much of the uneven sandy land near the crests of the river banks would actually pay better if planted with groves than it does under crops. Thakur Baldeo

Singh of Saranth has recently been experimenting in this direction and it will be interesting to see the result.

There are no stone quarries in the district and when stone is required for building purposes it has to be imported from Agra. But block *kankar*, or deposited limestone, which is found throughout the district, generally in the uplands, forms a very good substitute, and is used largely in the construction of bridges, wells and other buildings. Its durability is attested by the considerable remains of carved facades, pillars and other architectural ornaments which are still found lying about in good preservation on the old *kheras* or mounds which mark the sites of ancient and long vanished cities. In building the better class of houses bricks are chiefly employed, the ordinary cost of first-class well burned bricks, 9 inches by  $4\frac{1}{2}$  by 9 being Rs. 10 per thousand. Lime burned from *bichua kankar* with cowdung and other refuse costs about Rs. 25 per 100 maunds, 100 cubic feet of *kankar* yielding 75 cubic feet of ground lime and 100 cubic feet of unground lime, while the cost of burning is about Rs. 2 per 100 maunds. The principal use of *kankar* is for metalling roads, and the cost of digging and stacking 100 cubic feet of it at the quarry is about Rs. 2. The cost of carriage per 100 cubic feet is ten annas per mile for three miles and under, and for over three miles eight annas a mile, and that of consolidation for the same quantity is a rupee, so that the metalling of a road 12 feet wide and  $4\frac{1}{2}$  inches in depth at Rs. 3-12-0 per 100 cubic feet costs nearly Rs. 900 a mile. The ordinary compensation for disturbance to the owner of the land covering the *kankar* quarry is four annas per 100 cubic feet. Of the timbers used in building the imported *sal* timber is the best, but is expensive, costing Rs. 4 per cubic foot. Next best is *shisham*, which is rather scarce and costs about Rs. 2, while *nim*, *mahu*, tamarind and *jamun* are fairly plentiful and can be had for Re. 1-8-0. The common mango wood, which is universally used for inferior work, costs only Re. 1 per cubic foot.

Wild animals are fairly numerous in Etah, though none of the larger carnivora, except wolves, actually reside in it, leopards being rare visitors. Wolves are very scarce and the 78 for which rewards were granted in 1900 probably included many jackals,

the numbers rarely running into two figures in other years. Wild cattle used to be fairly plentiful in the *dhak* jungles round Jaithra and Arjunpur in pargana Sirhpura, but their numbers have been steadily decreasing and only one herd now remains as Shahbazpur on the Ganges and another at Karoli Sohagpur near Jaira. The *nlygai* (*boselaphus tragocamelus*) too is now rare, being found only here and there in the Jaithra jungles near Umargarh in the Jalesar tahsil, and at Shahbazpur. The hog deer (*cervus porcinus*) is found along the Ganges, particularly at Kadirganj, which is probably the lowest limit of its occurrence in these provinces. The wild pig is found in decreasing numbers on the Ganges and to some extent in *dhak* and thorn jungle all over the district. A greater nuisance to the cultivator is the black buck, herds of which are to be met with in most parts of the district, more especially in the Jalesar tahsil, but a head of over 18 inches is a rarity. The piety of former Rajas of Awa, rigid adherents of the Vaishnava cult, protected them in past times, but this protection is now removed. Of smaller animals the porcupine and the hedgehog—called *parbati chuha*, “the rat of the goddess Parbati,” or *kanta chuha*, “the prickly rat”—are both common in Jalesar, while an occasional specimen of the rare desert fox, the badger (*bijju*) and the armadillo (*salu samp*) sometimes makes its way up from the ravines of the Jamna. Pea-fowl are everywhere abundant, and are generally protected by village superstition. The wild-fowl for which the northern part of the district was once famous have been driven to seek other resting places by the drainage operations which have been carried out along the Burhganga valley, and, though snipe are still abundant, the duck only settle in the places where the stream widens out into a *jhil*. The grey and black partridge are both fairly common, the latter more particularly near the Burhganga, and hares and pigeons are both plentiful, the huge flocks of the latter which frequent the Jalesar tahsil in the cold weather being indeed quite a notable feature of the district. Sand-grouse are found in small numbers and the imperial grouse very occasionally.

There is not much fishing in the district, as there are few large lakes and rivers, and Kahars and Dhimars, the only castes who engage in fishing, only do so as a casual resource at certain seasons. Though most of the castes found in the district eat fish, little is brought to market and it seldom fetches more than one anna a pound. In the Ganges and the deeper pools of the Kali Nadi the sweep-net is employed, while in the shallow parts of the latter stream in the hot and cold weather the stream is dammed and then netted, or a casting net with a mesh of one-third of an inch is made use of. The sauno method is resorted to in the tanks and jhils and sometimes fish are taken on a hook and line. There are several varieties of fish found in the district, the most common being the *lunchi*, *bhur*, *ruhu*, *saur*, *seni*, *kadhu*, *kench* and *geur*. The pools left in the Lower Ganges canal when it is emptied during the monsoon give excellent sport with a rod and line.

Etah has no breed of cattle peculiar to itself, the animals used for agricultural purposes being of the usual small, thin, wiry breed common to the duab. Down in the west of the Jalesar tahsil the cattle are noticeably finer than in the rest of the district, probably owing to the neighbourhood of the great grazing grounds across the Jamna. But another reason arises out of the needs of the tract. Whereas in the greater part of the district the spring level is high and the labour of well-irrigation consequently light, in the region west of the Isan the deep spring level makes a much more powerful type of animal necessary to work the wells, and a pair of bullocks, which elsewhere could be bought for Rs. 25 to 50, will there cost from Rs. 80 to Rs. 100.

The favourite bullock for work at the wells is the smallish but active and plucky beast reared in the ravines of the Chambal. The improvement of the inferior local breed of cattle has been a good deal neglected in the past; but the matter has been taken up by the late Raja of Awa, who imported a number of good bulls and started a breeding farm at Awa which ought in time to have a considerable influence in raising the standard. Enquiries made on the Raja's estate have brought out strongly the value of the cow buffalo to the cultivator of the duab. There are two

varieties, one giving a calf each year (*barasi*) and the other calving every second year (*dobarasi*). The value of these two kinds is about the same. A good animal will give on an average 8 *sers* of milk per diem. This will produce about 120 *sers* of clarified butter, worth Rs. 60 per annum, and the calf will be worth Rs. 10, or Rs. 70 in all. The cost of feeding the animal while it is in milk will be about Rs. 5 per mensem, or Rs. 40 in all, leaving a cash profit of Rs. 80 per annum. This leaves out of sight the value of the buttermilk (*mattha*) and the dung. It is not easy to say what the buttermilk is worth. If the owner lives near a city there is some sale of it to the lowest class of the population. But the price is nominal—about two maunds to the rupee or say 20 gallons for a shilling. In villages there is no sale for it: in fact it is considered rather a disreputable action to sell it. The cultivator and his family consume as much of it as they like and give the rest back to the buffalo and her calf, or distribute it to beggars. But on the other hand it saves grain, and a cultivator with one buffalo would be able to reduce his expenditure of grain by a *ser* per diem or 30 *sers* a month. This, supposing the grain to be one of the millets which are the ordinary food of the people, would be worth at least Rs. 12 in eight months. Further, though the buttermilk has not much cash value, it is almost the only animal food the Indian cultivator gets, and for the young children it is one of the necessaries of life. A buffalo too is a valuable means of raising money in an emergency, as the village shopkeeper will always give an advance on the season's butter, the usual amount advanced in the district on an ordinary buffalo being Rs. 16, while the animal itself is always good security for a loan. In all then the annual income from the sale of the butter and the calf *plus* the saving in grain effected by the consumption of the buttermilk will be about Rs. 80, while the cost of the animal's keep amounts to Rs 40. There is thus a profit of Rs. 40, which will, in ordinary cases, about pay the rent.

The first regular cattle census was taken in 1899, the second census was taken in 1904 and the last in 1909. The statistics for earlier censuses, consisting as they do of the unchecked

estimates of patwaris, are of little value. A comparison of the results of each census shows some rather remarkable variations. The number of bulls and bullocks enumerated at the first census was 180,005. It fell to 178,116 at the following census and at the last census it was lower still, *viz.* 157,760. Cows, of which there were 94,820 in 1899, had diminished to 88,066 in 1904 and to 68,343 in 1909. The same steady decrease is found in the case of male buffaloes, which numbered 22,864 in 1899, 21,547 in 1904, and 20,230 in 1909. In the case however of cow-buffaloes the increase has been continuous, *viz.* from 95,769 in 1899 to 107,079 in 1904 and to 108,006 in 1909, while in the case of young stock of all kinds there was an increase at the second census from 180,873 to 194,326, but a falling off at the last census to 174,742.

The total head of cattle in the district has thus decreased by 60,053 as compared with the 1904 census and by 43,250 as compared with the census of 1899. The plough animals at the 1904 census were 190,663 as against 201,816 in 1899, or a decrease of 2,153—the average per plough being 2.23 against 2.35. The average is a little below the provincial average.

It may be noted that the figures given in the report of the recent land revenue settlement (1904-05) differ materially from these. According to the settlement officer the number of ploughs in the district is 81,844 and the number of plough-cattle 171,205, which gives an average of 2.09 animals per plough. Taking the figures for the cultivated area given in the settlement report, *viz.* 705,867 acres, the average plough duty comes to 8.6 acres, which is well above the provincial average of 7.62, while, if the number of ploughs returned at the latest cattle census be accepted, the average sinks to 7.9, which is still above that of the provinces.

According to the 1909 census there were altogether 13,522 horses and ponies in the district. These are for the most part of the ordinary type so common in the province, of small size and little strength or speed, and cost from 20 to 30 rupees apiece. Larger animals fetch from 40 to 70 rupees, while the wealthier classes go for their horses to the Batesar fair in the Agra district and pay from 150 to 300 rupees for them. A certain amount has been done both by the Government and by private effort to improve the breed of horses in the district. Up to 1905 an Arab stallion

stood at Etah, and the records show that an average of 40 foals were bred from it yearly. Then it had to be destroyed for dourine, and financial considerations have hitherto unfortunately stood in the way of its replacement.

The other domestic animals are not deserving of any special note. There were 40,334 sheep and 95,225 goats in the district in 1909. These are of the ordinary kinds and are kept, the sheep for their wool, the goats for their hair and for milking, while both are of great value in adding to the inadequate supply of manure. There were 10,301 donkeys, used for the most part by Dhobis and Kumhars, 95 mules and 502 camels. These last however are usually brought in from other districts by traders and are not much employed by natives of the district, carts and pack bullocks representing the ordinary local means of transport.

There is always a certain amount of cattle disease in the district, but the statistics are untrustworthy. The district board has employed an itinerary veterinary assistant since 1898, and it is his duty to visit any village where an outbreak of disease is reported and to attend to sick cattle. He also inoculates against rinderpest and anthrax, but only at the owners' request, and hitherto the apathy of the cultivator, coupled with his inveterate suspicion of novelties in medical procedure, has prevented much use being made of this method of prophylactic treatment. In 1908 a veterinary hospital was opened in Etah city and its progress will be watched with interest.

The climate of Etah varies between remarkable extremes. The hot weather is characterized by an intense dry heat, while sand and dust storms are of almost daily occurrence. In the cold weather on the other hand there is generally a piercing wind which renders the air exceedingly cold. It is however a healthy district on the whole. The rains generally cease about the end of September, and the cold weather sets in a month later, lasting until the end of February.

Records of the rainfall are kept at the four tahsil headquarters of Etah, Kasganj, Aliganj and Jalesar and are available from 1864 onwards. From these it appears that the district average is 29.2 inches but that the variations from the normal are

very wide, the totals ranging from 13.05 inches in 1905 to 42.28 inches in 1879. The local variations are also considerable, the eastern portion of the district almost always receiving more rain than the western. In Aliganj a fall of over 30 inches is common, while one of 40 inches is not infrequently exceeded. The district is unfortunately only too susceptible to deviations from the normal rainfall, particularly to deviations in excess, and a cycle of wet years is always fraught with serious trouble to the local agriculturist. Such a cycle occurred in 1885-89 when the district average for the five years was 34.9, while in Aliganj the average was 40.79, over 55 inches being received in 1888. During these years the rainfall was not only exceptionally heavy, but it was prolonged to an unusually late date in the season. The result was a period of acute agricultural depression to which reference has already been made, and the effects of which have hardly yet passed away. In the four years from 1893-96 the average fall was nearly as heavy, viz. 33.2 inches, but it was received earlier in the season, and much less mischief was done. Since then the district has, like the rest of the province, been passing through a dry cycle of years, and has had the opportunity of recovering from the excessive moisture. These years have shown that its network of canals protects it against drought. It remains to be seen whether the new drainage works will be equally effective against swamping. If so, Etah would seem now to be proof against all vagaries of rainfall.

The healthiness or otherwise of the district can best be illustrated by an examination of the vital statistics. As elsewhere these are somewhat vitiated by inaccurate registration, especially in earlier years, but none the less they are of considerable value as representing the general condition and affording a basis of comparison for different years and periods. Records of deaths are in existence for every year from 1871 onwards, but during the first decade, or at any rate up to 1877, the figures are obviously too low, ranging from 18 to 25 per mille. For the whole decade the average death-rate obtained from the official figures is 29.62 per mille, but this is swollen by the abnormal death-rates of the famine year of 1878, when the mortality rose to 36.80 per mille and of 1879, the year of the terrible fever

epidemic, when it reached 80·61 per mille. During the next ten years, for which the figures are more trustworthy, the average number of deaths to every thousand of the population was 33·70, the maximum being 41·98 in 1884, when the ravages of small-pox were experienced in an extreme form, and the minimum 24·23 in the preceding year. For the last ten years of the century the average death-rate was 32·40, varying from 23·62 in 1893 to 41·75 in 1899, when fever prevailed to a most unusual extent. During the opening years of the present century the average death-rate has risen to 36·17, an increase due to serious outbreaks of plague in 1905 and 1907, which brought the annual rate up to 45·10 and 43·26 per mille for those years respectively. Returns of births are available from 1879 onwards and show a consistent and satisfactory excess of the birth-rate over the death-rate except during the period between 1884 and 1890, when the prosperity of the district was at its lowest ebb and the acute agricultural distress caused by the abnormal rainfall was reflected in a serious decline in population. Altogether the vital statistics show that while Etah cannot be considered one of the most healthy districts of the provinces there has been a considerable improvement of late years, and the death-rate has been lowered appreciably as compared with that of the adjoining districts, as well as with the provincial average. The vital statistics from 1891 onwards will be found in a table in the appendix.

Another table given in the appendix shows the chief causes of death. The accuracy of this however can only be regarded as approximate, as the responsibility for the diagnosis of the diseases which have caused death rests, in the vast majority of cases, entirely with the village chaukidar. Fever heads the list, as in other districts, by a large number, but the term covers not only malarial fever, but also influenza, pneumonia, phthisis, debility, and all the other common diseases of which fever is only a symptom. Between 1871, the year for which records are first available, and 1880 the annual mortality averaged 24·45 per thousand of the total population, rising to over 77 per mille in the epidemic year of 1879. In the next decade the proportion was just under 28 per mille. Nothing resembling an epidemic occurred during this period and the consistently higher figures are probably to be

ascribed in part to more accurate and complete registration and in part to the unusually heavy rainfall of those years. During the last ten years of the century the average was 23 per mille, the greatest mortality occurring in 1899 when fever accounted for over 74 per cent. of the total number of deaths recorded. From 1901 to 1907 the average annual mortality from fever was again 23 per mille, the maximum being 27·28 in 1903.

As will be seen from the table, cholera has not prevailed in the district in an epidemic form since 1891, and the proceeding twenty years for which statistics are available were no less fortunate in this respect. The highest mortality from this disease occurred in 1875 and 1887, when the deaths attributed to it amounted to 2·64 and 2·92 per mille of the total population respectively. In most years the number of deaths caused by cholera is insignificant, and in 1874, 1888, 1893, 1904 and 1905 the district was entirely free from it.

Plague made its first appearance in the district in 1904, but in that year caused only 1,008 deaths. In the following year however it assumed the proportions of a terrible epidemic and the mortality due to it rose to 12,203, or 14·12 per mille of the total population. In 1906 there was a lull, but in 1907 it again broke out in a virulent form and the mortality rose to 8,495, or 9·33 per mille of the total population. Even this figure is, however, insignificant when compared with the returns from some of the neighbouring districts. The usual preventive measures, consisting in the evacuation and disinfection of infected villages, inoculation, and the destruction of rats, have been attempted with varying degrees of success. Experience is gradually teaching the villagers of Etah, as of other districts, the advisability of quitting their villages as soon as any dead rats are noticed. but it has not yet been found possible to overcome their suspicions in regard to inoculation, and in 1907 only 27 persons were persuaded to subject themselves to the ordeal. The campaign against rats has been much more successful, no less than 16,654 being destroyed during the year.

Little remains to be said of the other diseases except small-pox. This occurs every year to a greater or less extent and occasionally causes great loss of life. The worst year on record

was 1873, when the mortality rose to 7.17 per thousand of the total population, and another severe epidemic took place in the famine year of 1878, when the death-rate from this cause was over 6 per thousand. But these figures are quite exceptional, and the average annual mortality for the decade ending in 1880 was 1.77 per mille. This fell during the next ten years to .84, and to 49 between 1891 and 1900, while from the latter year until 1907 the annual average has only been .11 per mille. The regular and striking decrease in the death-rate from small-pox manifested by these figures is no doubt to be attributed to the increasing popularity and general adoption of vaccination, the practice of which has been steadily spreading in the rural areas as well as the towns of the district. The numbers vaccinated increase every year, and the proportion of the younger population which is now protected is very large.

Statistics of infirmities have been collected since 1872 at each census. At the last enumeration there were 2,105 persons recorded as suffering from insanity, deaf-mutism, blindness and leprosy, a slight decrease from the figures of the previous census when the total was 2,155. There has however been an increase under two heads. In 1891 there were only 49 persons returned as insane, while in 1901 the number was 107. Though there has been a general increase of insanity throughout the province this rise much exceeds the average. There has also been a slight increase in the number of blind persons—from 1,549 to 1,562. On the other hand deaf-mutes have diminished in number from 395 to 279, and lepers from 162 to 157. As in other districts the number of males returned as suffering from infirmities far exceeds that of females the respective totals being 1,278 and 827, and there were only 19 women afflicted with leprosy to 138 men. It is possible that the difference may be partially due to concealments, the provincial average being 28.2 women to 100 men.

## CHAPTER II.

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### AGRICULTURE AND COMMERCE

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As described elsewhere, the physical characteristics of the district are of a nature to cause very considerable fluctuations in the area under the plough at any one time. Statistics with any pretensions to accuracy are not available before 1840, or in the case of Jalesar 1836, and, owing to subsequent transfers of territory, even these are not more than reasonably approximate. The fact too that the district is composed of a number of fragments which belonged to and were settled with five different districts, where the surveys and settlements were carried out by different officers on different principles, adds an additional element of uncertainty. Making allowances for these disturbing factors it appears that of the territory now comprised in the Etah district some 545,027 acres were under cultivation at the time of the first settlement made under Regulation IX of 1833. This figure is kept down by the fact that the paiganas of Etah-Sakit, Sonhar, Sirhpura and Sahawar were settled in 1839-40 just after the great famine of 1837-38 described by the settlement officer Mr. Edmonstone as having been attended with "unusually disastrous results." At the time of the next settlement, which closed in 1873, this portion of the duab was at the zenith of its prosperity, cultivation having everywhere been pushed to its furthest limits during a series of favourable seasons, and the area returned as under cultivation was 716,661 acres, an increase of 32 per cent. in the period. This area may probably be taken as representing the maximum possible under present conditions and as considerably higher than can be continuously maintained. It has in fact never again been reached, though the 705,867 acres of the recent settlement of 1905 may be regarded as practically equivalent to it, when allowance is made for losses by Gangetic diluvion. Between these two however intervenes a period of remarkable fluctuations

during which cultivation fell off all over the district, though the decrease was not really noteworthy except in the northern parganas. The contraction of cultivation began in 1885 with the excessive rainfall, and continued during the series of wet years which followed, culminating in 1890-91, when the *tarai* tract had lost 34 per cent. of its cultivated area, the central duab 36 per cent. and the Kali Nadi valley 31 per cent. The comparative stability of the tract south of the Kali Nadi was well illustrated by the fact that it lost only 5 per cent. of its cultivation at this time. After 1890-91 there was a slow but steady recovery. How gradual this was may be judged from the fact that though 12 years later the recovery was complete, the central duab having actually extended its cultivated area by 1 per cent. beyond the limits of the previous settlement and the *tarai* and Kali Nadi valley being respectively only 5 and 1 per cent. behind their old totals, a difference mainly due, in the one case to diluvion and in the other to destruction of soil in the great flood of 1885, yet, when spread over the whole period of 12 years the average cultivated area in these tracts remained at from one-fifth to one-fourth below that of the settlement of 1873. The variations within these tracts between pargana and pargana were considerable. In Soron for instance the cultivated area had decreased by 26 per cent. in 1890-91, but had risen by 3 per cent. in 1902. In the unirrigated portion of Patiali the loss was no less than 53 per cent. in 1890-91, while by 1902 this had been made up and cultivation extended by 5 per cent. Azamnagar again after losing 30 per cent. has added 1 per cent.

One of the features of the agricultural history of the Etah district during the last 30 years has been the remarkable increase in the practice of taking two crops a year off the land. This is a sign of improved methods of agriculture and has been rendered possible by the great extension of canal irrigation. At the old settlement in 1872 only 15,987 acres, or 2.2 per cent. of the cultivated area, bore more than one crop in the year. The average double-cropped area for the five years which preceded the recent settlement of 1904-05 was 143,531 acres, or 20 per cent. of the total cultivated area. The actual area of the year of verification was a good deal less than this, amounting only to 90,793 acres,

but this was undoubtedly due, as the settlement officer points out, to deliberate abstention from irrigation in that year, which was generally practised throughout the district, with a view to showing a smaller irrigated area and thus obtaining lighter assessments. The figures giving the average for the preceding five years are unquestionably more fairly representative. The increase in the *do-fasli* area is not confined to any one portion of the district but is universal, though in some parganas the percentage is more startling than in others, owing to the more complete absence of the practice in the past. In Soron, for example, where such a thing was formerly unknown, 7·4 per cent of the cultivated area is now cropped twice over. In the adjoining parganas of Sahawar and Sirhpura, where in 1878 the *do-fasli* area was .4 and .2 per cent. of the cultivated area, it is now 11·3 and 9 per cent. respectively. In Barna it has risen from 3 acres to 1,815, and in Azamnagar from 2,275 acres to 14,402. In Jalesar too even in the year of verification when, to quote the settlement officer, "every effort seems to have been made to reduce the irrigated area," and where at the last settlement the double-cropped area was as much as 10·73 per cent. of the cultivated area, the rise has been no less remarkable and the percentage was 19·65. Whether this development can be pushed much further without the risk of serious exhaustion of the soil is a question not easily to be answered. But it does not appear that there are at present any signs of such exhaustion, the prevalent system of rotation of crops appearing to be adequate to the restoration of the necessary properties of the land.

It has been pointed out in the last chapter that a new principle of classification has enormously increased the area shown as culturable waste in the settlement records. The figures have been still further swelled by transfers from the area formerly shown as fallow. At the settlement of 1873 only 4,513 acres were returned as culturable waste. According to the new survey this now amounts to 198,256 acres. Only 57,354 acres now appear as old fallow instead of 124,349 acres, while new fallow also has diminished by 10,861 acres and now only amounts to 13,200 acres. As has been seen, this decrease in fallow is not to be accounted for by an extension of cultivation—the reverse

having taken place; but in this case again a changed system of classification is the only explanation. The discovery of some method of completely and inexpensively reclaiming *usar* might, of course, render a great deal of this so-called culturable waste available for the plough, but until that very desirable consummation is achieved it is probable that it will continue to be left untouched. The old fallow again represents as a rule land which has been brought under the plough for a season or two when the district agriculture was at a high point of prosperity, and land was in great demand, but abandoned as soon as the temporary boom was over, as not worth the cost of continued cultivation. Nor is the proportion of new fallow likely to be much reduced in a district where so much of the soil is light and sandy, imperatively requiring frequent periods of rest if it is to be cultivated at all successfully.

The methods of agriculture differ little from those in practice in the surrounding districts. There has been, of late years, a general improvement in the style of cultivation, mainly due to the great extension of canal irrigation which has rendered possible the extension of double-cropping, and an enormous increase in the more valuable *rabi* area. But the general style of cultivation is broad and not yet of a very high quality, while there is little of that intense cultivation which is usually associated with the Kachhi caste, garden crops only occupying about 1 per cent. of both the *kharif* and *rabi* areas. In actual methods of cultivation there has been little if any alteration, the innate conservatism of the Indian cultivator leading him to view all innovations with the deepest suspicion, while his natural improvidence prevents him from profiting by many of the lessons of experience. One innovation however has been universally adopted, and the iron sugarmill has driven the old stone press out of the field. With this exception all the implements in use are exactly the same as those employed for hundreds of years past. The *rabi* area, which at the settlement of 1873 fell short of the *kharif* area by over 45,000 acres, now exceeds it by over 20,000, the respective totals being 407,447 and 386,970 acres. This increase in the *rabi* area is almost entirely due to the great increase in the area bearing two crops as the *kharif* has only

suffered to the extent of rather over a thousand acres, and is very general. At the 1873 settlement the *kharif* exceeded the *rabi* in every pargana. There are now only six where it is not in defect. These are the five parganas of Faizpur Badaria, Aulai, Pachlana, Bilram and Sorou, which together make up the northern corner of the district, and pargana Jalesar, away in the south-west corner, and in all of them except Jalesar the *rabi* is steadily gaining on the *kharif*.

Though there has not been much change in the area covered by the *kharif* harvest, there have been great changes in the proportions of the crops of which that harvest is composed. In this district as elsewhere there has been a great tendency to grow crops in combination instead of singly. It was formerly more usual to grow both *bajra* and *juar* by themselves. They are now almost always grown in combination with *arhar*. *Bajra*, which in 1873 covered 159,975 acres, or more than 41 per cent. of the total *kharif* area, has sunk to 114,224 acres, and now comes only second to *juar*, which has risen from 90,349 acres to 114,883. Only in the Jalesar tahsil has the area under *bajra* increased to any appreciable degree, though there has been a small rise in Pachlana. This increase in *juar* at the expense of *bajra* is one of the many signs of improved cultivation, as *juar* is the more valuable but at the same time the more delicate crop of the two, needing more irrigation or else a better soil. The advent of the canals has made it possible to grow *juar* in the light sandy soils which were before unfit for anything but the hardier *bajra*. Maize, which at the last settlement was only sown in 9,640 acres, has multiplied its area more than five-fold and now occupies 54,215 acres, taking the third place in importance among the *kharif* staples. This enhanced popularity is due to the early date at which maize ripens. A failure of the rains in September, which may involve the total loss of promising crops of *juar* and *bajra*, finds maize beyond the reach of danger, provided it was sown in good time; and this early ripening has the additional advantage of enabling the crop to be harvested in time to plough the land for a spring crop, which is not possible in the case of the millets. An extension of the double-cropped area is therefore sure to be accompanied by an

extension of the area under maize. Cotton has considerably declined and now covers only 48,074 acres as compared with 71,422 acres at the last settlement. Only in Jalesar has there been an appreciable increase, from 13,428 acres to 15,735 acres. This is to be explained by the fact that the Raja of Awa has set up a ginning factory at Jalesar and is making great efforts to stimulate the production of cotton on his estates, making arrangements with the cultivators similar to those which used to govern the production of indigo. It is probable that there will be a revival of cotton cultivation before long.

Sugarcane is now grown on 16,887 acres, an increase of 2,500 acres since 1872. This is the more remarkable considering the amount of *tarai* land which has been cut away of recent years by the Ganges. No less than 1,341 acres of sugar-growing land have been lost owing to this cause in the three parganas of Faizpur Badaria, Aulai and Nidhpur. On the other hand the improved drainage of the Burhganga *tarai* has made a great deal of land which was formerly inundated available for cultivation. In Bilram for instance the area under sugar has risen from 285 to 871 acres, and in Sahawar from 872 to 1,537 acres. As many as ten different sorts of cane are grown in the district, but the commonest in the chief sugar-growing tract in the north of the district is *chin*. The thick soft *paunda*, meant for chewing, is mainly grown by *zamindars* and comparatively wealthy people in suburban gardens. The method of culture of cane is the same in all cases. The cane for seed is cut into short lengths called *painra* and stored in small underground vaults. It is sown in January and is ready for cutting at the end of the year. The first sprouts are known as *kulpa*; when a little taller it becomes *ikh* or *ikhari*; when the knots (*poi*) on the cane become distinct it is termed *ganna*, and when ready for cutting, *ganda*. After being cut and cleaned (*chhol*) the canes are gathered into bundles (*phandi*) of one hundred each and taken to the mill. The resultant juice is boiled to make the raw sugar or *gur*, after the first of it has been distributed among the pressers, village carpenters and blacksmiths, during a ceremony termed *rasyawal* or *raswai*. Another festival accompanies the distribution of the first *gur*, which is termed *jalawan* by Hindus and *sinni* by Musalmans.

Sugar-cane.